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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,223	12/15/2003	Patrick Moller	10760.0001-00000	8649

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EXAMINER	
VAN, LUAN V	

ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
09/02/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/734,223	MOLLER ET AL.	
	Examiner	Art Unit	
	LUAN V. VAN	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 July 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *72-96* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *72-96* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant's amendment of July 9, 2008 does not render the application allowable.

Status of Objections and Rejections

All rejections from the previous office action are maintained.

Claim Rejections - 35 USC § 102 and 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 72-78, and 85 are rejected under 35 U.S.C. 102(b) as being anticipated by Cohen '369 (US patent 6475369).

Regarding claim 72, Cohen '369 teaches a method for creating structures in an electrically conductive surface of a substrate, comprising: defining a pattern by using a master electrode, the master electrode comprising an electrically conductive surface 8 (Fig. 1-2, 11b, column 4 lines 56-63 states that the support 8 can be an anode) and an insulating pattern layer 6, the electrically conductive surface of the master electrode being of a first material (such as platinized titanium, column 7 lines 49-52), by: bringing the master electrode in close contact with the electrically conductive surface of the substrate (column 5 lines 4-6) such that at least one cavity (i.e., space between the mask 6) in the master electrode is defined by the electrically conductive surface of the substrate 2, the electrically conductive surface of the master electrode, and the

insulating pattern layer of the master electrode (Fig. 2 and 11); and patterning the substrate by an electrochemical transfer process (i.e. electroplating, called 13 lines 40-59), wherein material is dissolved at an anode (i.e., with a soluble anode, column 7 lines 48-52) and deposited at a cathode, and an electrolyte solution is used as a transport medium, wherein: the electrically conductive surface of the master electrode is the anode 8 (column 4 lines 56-63), the electrically conductive surface of the substrate is the cathode, and the dissolved material is an anode material, which is pre-deposited (i.e., redressing the anode by plating metal back onto the anode through the negative features of the mask (column 7 lines 54-57) would read on pre-depositing in the cavity of the master electrode) in the at least one cavity defined in the master electrode. The first material, i.e. platinized titanium, is less dissolvable than the anode material in the electrolyte solution, because the first material "does not erode" (column 7 lines 49-52).

Regarding claim 73, Cohen '369 teaches wherein the first material is chemically inert in the electrolyte solution used because the first material "does not erode" (column 7 lines 49-52).

Regarding claims 74 and 75, Cohen '369 teaches further including connecting an external plating voltage in such way that the substrate becomes the cathode and the master electrode becomes the anode in local electrochemical plating cells, the plating cells being defined by the at least one cavity in the master electrode, in which cavity the anode material has been pre-deposited (Fig. 11b).

Regarding claim 76, Cohen '369 teaches that the "anode can be 'redressed' periodically by reversing the polarity of the anode and plating metal back onto the anode through the negative features of the mask" (column 7 lines 54-57).

Regarding claims 77 and 78, further including applying an external etching voltage in such way that the substrate becomes the anode and the master electrode becomes the cathode in the local electrochemical etching cell, the cell being defined by the cavity in the master electrode (column 26 line 7-15).

Regarding claim 85, Cohen '369 teaches pulsing the plating current (column 20 lines 13-29).

Claims 81-84, 93, 94, and 96 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen '369.

Cohen '369 teaches the method as described above. Cohen '369 differs from the instant claims in that the reference does not explicitly teach the material of the substrate being a semiconductor or conductive polymer (83 and 84).

Regarding claims 81 and 82, Cohen '369 teaches that the substrate to be plated functions as the cathode (column 4 lines 50-52), and that the substrate to be plated can include a conductive surface or a nonconductive surface provided with the conductive layer. Further, the substrate to be plated can also be a previously electroplated or deposit metal or a layer that includes at least one metal (column 14 lines 53-58). Since copper and nickel is the electroplated on the substrate to form the three-dimensional structure in the method of Cohen '369, this teaching reads on claims 81 and 82.

The examiner takes Official Notice that metal, conductive polymer and semiconductor substrates are conventionally known in the art for use in forming microelectronic devices. If the applicant disagrees, he should so state on the record in response, as per MPEP 2144.03.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used a semiconductor or conductive polymer substrate in order to form a three-dimensional device having the desired electrical and mechanical properties.

Regarding claims 93 and 94, Cohen '369 differs from the instant claims in that the reference does not explicitly teach the concentrations of supporting electrolyte and chemical oxidation agent (claim 93), or counter ions (claim 94). Regarding claim 93, Cohen '369 does not discuss the electroplating bath in detail, and thus do not mention a supporting electrolyte or chemical oxidation agent. It would have been obvious to one having ordinary skill in the art to have omitted these components in a conventional electroplating bath since the metals in Cohen '369 can be plated successfully without them. Regarding claim 94, it would have been obvious to one having ordinary skill in the art to have expected that the counter ions in the electrolyte solution of Cohen '369 are exchanged to ones which provide higher solubility, because Cohen '369 uses the same electrolytic process and solution as that of the instant invention.

Regarding claim 96, the electrolyte of Cohen '369 is an optimized electrolyte.

Claims 79 and 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen '369 in view of Burnham (US patent 3190822).

Cohen '369 teaches the method as described above. Cohen '369 differs from the instant claims in that the reference does not explicitly teach cleaning and etching the electrode.

Burnham teaches a method of electrolytically etching surfaces of in the valve metal electrodes in order to increase their surface areas so as to make it possible to use relatively small electrodes (column 1 lines 14-18).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Cohen '369 by etching the electrode as taught by Burnham, because it would increase the surface area of the electrodes, and because it would remove contaminants from the surfaces of the electrode.

Claims 86-89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen '369 in view of Tang et al. (US patent 6036833).

Cohen '369 teaches the method as described above. Cohen '369 differs from the instant claims in that the reference does not explicitly teach the specific frequency of the instant claim or periodic pulse reverse.

Tang et al. teach an electroplating method using periodic pulse reverse and a frequency from 100 to 10,000 Hz (column 2 lines 8-9).

Addressing claims 86 and 87, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Cohen '369 by using the frequency of Tang et al., because it would produce a more fine-grained and hard plating metal (column 1 lines 33-37 of Tang et al.).

Addressing claims 88 and 89, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Cohen '369 by using the periodic pulse reverse of Tang et al., because it would reduce the internal stress of the electrodeposit (column 2 lines 55-60 of Tang et al.).

Claims 90, 91 and 95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen '369 in view of Scott (US patent 5196109).

Cohen '369 teaches the method as described above. Cohen '369 differs from the instant claims in that the reference does not explicitly teach a sequestering agent or the pH of the instant claim.

Scott teaches an electroplating method and composition using EDTA (column 6 lines 41-61) and a pH of 1.5 to 5.5 (column 6 lines 8-11).

Addressing claims 90 and 91, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Cohen '369 by using the sequestering agent of Scott, because it would prolong the useful operating life of the electrolyte necessitating less frequent treatments with precipitating agents or peroxide treatments to remove such harmful metal ions and organic

contaminants when their concentrations increase to objectionable levels (column 6 lines 48-54 of Scott).

Addressing claim 93, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Cohen '369 by using the pH range of Scott, because it would increase the conductivity of the electrolyte solution and hence reduce the power consumption required for electrodeposition (column 5 lines 63-65 of Scott).

Claim 92 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen '369 in view of Bernards et al. (US patent 4932518).

Cohen '369 teaches the method as described above. Cohen '369 differs from the instant claims in that the reference does not explicitly teach the additive system of the instant claim.

Bernards et al. teach a composition for electroplating copper onto a conductive surface comprising a solution having brighteners (i.e., accelerators), suppressors, wetting agents, and levelers (column 4 lines 29-55).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Cohen '369 by using additive system of Bernards et al., because it would improve the efficiency of the plating reaction and the quality of the metal deposit (column 1 lines 23-31 of Bernards et al.).

Response to Arguments

Applicant's arguments filed on July 9, 2008 have been fully considered but they are not persuasive. In the arguments presented on page 3 of the Remarks, the applicant argues that the erodable metal layer supported by a conductive material such as platinized titanium, as stated by the examiner in the previous office action, does not anticipate the limitation of pre-depositing in at least one cavity of the master electrode. Without acquiescing to the applicant's argument, the examiner has removed that statement from the office action. Cohen '369 still anticipates the pre-depositing step of independent claim 72, because redressing the anode by plating metal back onto the anode through the negative features of the mask as taught by Cohen '369 (column 7 lines 54-57) would read on pre-depositing in the cavity of the master electrode.

With respect to claims 81-84, the examiner relied on unofficial notice in the previous office action to reject the instant claims. Claims 81 and 82 are taught by Cohen '369 as described above. Regarding claims 83 and 84, the examiner hereby cites the teaching of US patent 5961806 referenced to Tatsuura et al., which teaches the following:

Materials of the electrode substrate on which the electrodeposition layer is formed are not specifically limited and may be selected from various electrically conductive materials including metals and organic or inorganic **semiconductors**, or their vapor deposition films. Noble metals such as platinum and gold or carbon which are highly electrochemically stable are preferably used. The desired color filter may be easily prepared using a transparent substrate such as glass or transparent film and a transparent electrode made of ITO (indium-tin-oxide) or **conductive polymer**. (Column 5 lines 53-63).

In summary, Tatsuura et al. teach that electrodeposition can be performed on a variety of substrate materials including a semiconductor and a conductive polymer. Furthermore, it appears that claims 81-84 are directed to new matter which is not

supported in the applicant's specification. However, to expedite the prosecution this application, the examiner will not further address this issue in this office action.

Conclusion

THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan V. Van whose telephone number is 571-272-8521. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LVV
August 29, 2008

/Edna Wong/

Primary Examiner, Art Unit 1795